

REGIONAL AND ETHNIC ASPECTS OF VIRAL HEPATITIS B AMONG PREGNANT WOMEN

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SUMMARY

Objectives: The aim of this study was to determine the prevalence of HBV infection among pregnant women in districts of Eastern Slovakia with a diverse prevalence of Roma population.

Methods: Overall 59,279 serum samples from 9 regional departments of clinical microbiology from Eastern Slovakia were collected in the period from January 2008 till December 2009 and analysed.

Results: The number of HBsAg positive samples overall and during pregnancy was 1.74% and 2.12%, respectively. Comparing districts with higher (>5%) and lower (<5%) Roma population, there was no significant difference in the prevalence of HBsAg positive samples overall (1.95% vs. 1.62%). However, in the subgroup of pregnant women the prevalence of HBsAg positive samples (2.72% vs. 0.95%) differs significantly ($p < 0.01$).

Conclusions: The prevalence of HBV infection among pregnant women in Eastern Slovakia did not rapidly exceed the estimated nationwide prevalence. However, in districts with higher Roma population the expected higher prevalence of HBV infection was confirmed. This indicates the need to pay special attention to the prevention of hepatitis B in these districts.

Key words: hepatitis B, pregnancy, regional differences, ethnicity

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INTRODUCTION

Worldwide, about 350 million people are chronically infected with hepatitis B virus (HBV), and about one million deaths per year have been reported due to chronic hepatitis, cirrhosis and hepatocellular carcinoma (1, 2). With regard to HBV, pregnant women are a specific target group due to the risk of vertical transmission of the infection, which occurs usually in the perinatal period and is the major cause of HBV transmission, particularly in countries of the world where HBV has intermediate to high prevalence. Mother-to-infant transmission represents a basic factor in maintaining chronic HBV infection and usually depends on the degree of maternal infectivity, especially in the perinatal period (3). It has long been recognised that prevention of perinatal transmission is a high priority in the attempt to decrease the global burden of chronic HBV (4). Pregnant women constitute a special subgroup which is subject to routine HBsAg screening because of the risk of vertical transmission. At the same time, pregnancy can modify the course of hepatitis B infection (5, 6).

The prevalence of chronic HBV infection varies widely, with rates ranging 0.1–20% in different parts of the world. European countries have either intermediate (2–8% HBsAg positive) prevalence (Eastern and Southern Europe) or low (less than 2% HBsAg positive) prevalence (Northern, Western, and Central Europe) (1). The prevalence of HBsAg positivity among pregnant women varies across the countries of Europe, ranging from less than 0.01% in North-West Europe to 1–4% in Southern Europe

(7). However, in these areas, prevalence may vary with race and ethnicity (8). The prevalence of HBsAg positivity in Slovakia is expected to be less than 2% and at the same time, regional and ethnic differences are expected (9), though they have never been explored and might also be a matter of high interest for other countries in Europe.

In regard to possible ethnic differences in the prevalence of HBsAg positivity, it is important to mention the existing minorities in Slovakia. Based on information from the Statistical Office of the Slovak Republic, there are several minorities living in Slovakia, with two of them predominating. Both the Hungarian and Roma minorities represent 5% of the population of Eastern Slovakia, where our data were collected. Other minorities living in Eastern Slovakia total less than 1%. The Hungarian minority is fully integrated into the majority population, in contrast to Roma minority, which frequently lives in separated or segregated settlements in very poor conditions, has low educational status, high unemployment and poverty, and might have worse access to health services (10, 11). All of these factors might contribute to worse health not only in general but also in the prevalence of specific diseases in an extra-vulnerable target groups like pregnant women with the risk of vertical transmission during pregnancy. At the same time, this minority has been only scarcely studied previously, and the prevalence of HBV infection among pregnant women in districts with different Roma minority population is unknown.

Therefore, the main aim of this study was to determine the prevalence of HBV infection in pregnant women in districts of

Eastern Slovakia with a diverse prevalence of the Roma minority population.

MATERIALS AND METHODS

Sample and Procedure

A total of 59,279 serum samples from 9 regional departments of clinical microbiology from Eastern Slovakia were collected in the period from January 2008 till December 2009 and analysed. HBsAg was detected (Enzygnost HBsAg 5.0, Siemens Healthcare Diagnostics Products GmbH) and the portion of HBsAg positive findings from the overall examined sample and among pregnant women was evaluated.

Statistical Analysis

Data were analysed with SPSS version 16.0. In the first step, basic descriptive statistics for every district were calculated to determine prevalence rates of chronic hepatitis B in the overall population and in the subgroup of pregnant women. In the next step, the odds ratio and Chi-square test were computed to compare the prevalence of HBsAg positive samples in districts with a lower and higher representation of Roma population.

RESULTS

Overall 59,279 serum samples were examined and 13,798 of them were part of the pregnancy screening. The number of HBsAg positive samples overall in the whole examined sample and HBsAg positive samples among pregnant women was 1,031 (1.74%) and 292 (2.12%), respectively. Table 1 provides information about the total amount of serums examined, the number of HBsAg positive samples overall in the whole examined sample, the total number of pregnant women and the number of HBsAg positive samples among pregnant women separately for 9 regions of Eastern Slovakia and for Eastern Slovakia altogether.

In the second step, based on information from the Statistical Office of the Slovak Republic, which reported the representation of Roma minority population in Eastern Slovakia to be 4.86%, 9 districts were divided into subgroups of regions with a higher and lower than average representation of Roma population, with the cut-off point at 5%. Table 2 provides information about the total amount of serums examined, the number of HBsAg positive samples overall, the total amount of pregnant women and the number of HBsAg positive samples among pregnant women for these two subgroups. The prevalence of HBsAg positive samples overall was similar in these two subgroups of districts (1.95% in districts with a higher representation of Roma population vs. 1.62% in districts with a lower representation of Roma popula-

Table 1. Prevalence of HBsAg positive samples overall (n, %) and HBsAg positive samples during pregnancy (n, %) in 9 regions of Eastern Slovakia

Region	Roma population (%)	Examined samples	HBsAg positive		Pregnant women	HBsAg positive pregnant women	
			n	%		n	%
Region 1	2.18	3,667	115	3.14	732	6	0.82
Region 2	2.51	16,010	248	1.55	2,186	28	1.28
Region 3	2.66	3,032	14	0.46	630	4	0.63
Region 4	4.74	2,977	40	1.34	1,227	9	0.73
Region 5	5.32	7,691	79	1.03	1,532	32	2.09
Region 6	6.36	5,390	82	1.52	627	17	2.71
Region 7	6.68	5,416	178	3.29	2,288	68	2.97
Region 8	6.78	9,651	67	0.69	1,575	4	0.25
Region 9	7.07	5,445	208	3.82	3,001	124	4.13
Total sample	4.86	59,279	1,031	1.74	1,798	292	2.12

Table 2. Difference in prevalence of HBsAg overall positive samples (n, %) and HBsAg positive samples during pregnancy (n, %) between regions with lower and higher representation of Roma minority population

	Regions with lower representation of Roma population (< 5%)		Regions with higher representation of Roma population (≥ 5%)		Chi-square
	n	%	n	%	
Examined samples	25,686	100	33,593	100	ns
HBsAg positive	417	1.62	654	1.83	
Pregnant women	4,775	100	9,023	100	
HBsAg positive pregnant women	47	0.98	245	2.72	p<0.01

ns – not significant

tion). The Chi-square test did not show any significant difference in the prevalence of HBsAg between districts with a lower and higher representation of Roma population ($p > 0.05$). On the other hand, the prevalence of HBsAg positive samples among pregnant women differs between these two subgroups (2.72% in districts with a higher representation of Roma population vs. 0.95% in districts with a lower representation of Roma population). The Chi-square test confirmed the significant difference between the districts with a lower and higher representation of Roma population ($p < 0.01$), with the prevalence of HBsAg positive samples being higher in districts with a higher representation of Roma population.

DISCUSSION

The main aim of this study was to determine the prevalence of HBV infection among pregnant women in districts of Eastern Slovakia with a diverse prevalence of Roma minority population. Our findings indicate a significantly higher prevalence of HBsAg positive samples among pregnant women in districts with a higher representation of Roma population, which suggests differences between the Roma and non-Roma populations in Slovakia.

The prevalence of HBV infection in pregnant women in different countries depends on the overall situation in the geographical area. In European countries, the prevalence of HBV ranges from $<0.1\%$ in North-West Europe to 1–4% in Southern Europe (8). Even within a single country there might be significant differences between ethnic groups. An example can be seen in the prevalence of HBV found in Greece (0.29% among Greek women compared to 5.1% prevalence among Albanian minority) in a study by Greek authors (12). A similar pattern was also described in a study conducted in Hungary (13).

Based on our results, similar patterns with possible differences between the majority population and the Roma minority might be seen in Slovakia. These findings might be of high importance, as this ethnic group has scarcely been studied before, they are also in line with two other studies on pregnant Spanish women from the Roma minority with a higher prevalence of HBV infection (14, 15). At the same time, it is important to identify pregnant women in this minority as a vulnerable target group because of their possible risk of vertical transmission from mother to child.

In chronic HBV infection, the risk of vertical transmission from mother to child depends on ongoing virus replication (viremia levels). The vertical transmission of HBV infection occurs mostly in cases where maternal viremia is high (8). In some countries, passive immunisation is administered only in cases where the mother is, in addition to HBsAg positive, also HBeAg positive and in whom increased ALT activity has also been found, although the reliability of the latter parameter is questionable (16). Most HBsAg positive pregnant women have a chronic infection that occurs as the so-called asymptomatic HBsAg carrier state with a good prognosis. However, there are known conditions, mostly associated with weakened immune system of the patient, when carrying the virus can lead to the exacerbation of the disease and eventually to chronic active infection (17).

The present study provides information about the prevalence of chronic hepatitis B among pregnant women and at the same time suggests the possible existence of ethnic differences in the

prevalence of HBV among pregnant women. Studies on HBV during pregnancy are scarce and the influence of ethnicity has not been fully explored in this region. However, we are aware of possible limitations. More detailed information should be collected in the future studies in order to obtain a more in-depth look at the possible determinants of the prevalence of HBV.

CONCLUSION

The prevalence of HBV infection among pregnant women in Eastern Slovakia did not rapidly exceed the estimated nationwide prevalence. However, in the districts with a higher representation of Roma population the expected higher prevalence of HBV infection in this population group was confirmed. This indicates the need to pay special attention to the prevention of hepatitis B in these districts.

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Ethical Recommendations

Ethical recommendations regarding data protection were followed.

Conflict of Interest

None declared

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